Ohio Agricultural Experiment Station

CIRCULAR NO. 136

WOOSTER, OHIO, MAY 15, 1913

CARE OF THE DAIRY HERD

CONTENTS

CARE OF THE DAIRY HERD

Suggestions on feeding and improving a dairy herd by breeding have been given in Circulars 128 and 135. Besides these two phases of the business, the general care of the herd is of much importance; and it is the object of this Circular to give a few helpful hints along this line.

EQUIPMENT

In order to successfully maintain a good dairy herd, the owner must provide adequate equipment with which to care for his animals; however, the equipment can not be discussed at length here. Only a few hints can be thrown out showing its bearing on the comfort, production and health of the herd.

It is not necessary and certainly not economy to provide expensive and elaborate barns and other equipment. The installation of elaborate equipment has been the cause of the failure of many dairy farms. The interest, depreciation, taxes, insurance, etc., on such equipment eats up all the profits. Where large sums of money are spent on buildings, it should be with the idea of securing utility and permanency rather than fancy appearance. However, certain requirements must be met. The cows must be kept comfortable and under reasonably sanitary conditions; and the man who cannot do this would better stay out of the business. It is possible to have better conditions in very cheap buildings than is frequently found in elaborate buildings. This depends on the man in charge. The main points to be taken into consideration when building are permanency, convenience, cleanliness, comfort and health. Farmers should look into the future and plan more durable buildings than is commonly done. Concrete, tile, and stone will be more commonly used in the future.

Convenience has to do with the possibility of doing the work easily and rapidly. This is best accomplished by storing all tools and supplies as near to the place where they are to be used as may be consistent with sanitary precautions. If a barn is properly located and arranged, there is no valid objection to storing feed above the cattle other than the greater loss in case of fire.

Cleanliness can best be secured in a stable of plain, smooth construction inside. The walls, ceilings, stalls, etc., should be smooth and tight and, if possible, washable. The relation of cleanliness to a wholesome product and to the health of the cattle is vital. This fact is plainly revealed by the present knowledge of bacteria and

their effects on health. Bacteria are always present where there is dirt and they may or may not be the kind which cause disease in cattle or man, or bad flavors and odors in the milk. Cleanliness means more than simply removing the visible dirt and includes the elimination of possible disease germs by disinfecting and by preventing their introduction. Stables and yards should be so constructed that manure may be easily and quickly removed some distance from the barn where it cannot be trampled by the cows. It is a mistake to consider the dairy cow a filthy animal. If given a chance, she will keep fairly clean, and will stand in filth only when compelled to do so to secure food or protect herself from flies. Good, solid yards may be provided by covering with 6 inches of broken stone, then with cinders or gravel. Gravel may be used without the stone. The yard should slope sufficiently to give good drainage. Muddy yards are to be avoided to prevent the cows from carrying filth into the barn on their feet or bodies. A dirty barn and surroundings may get filled with disease germs, which are often difficult to exterminate. There are certain diseases in which the germs are thrown out of the body with the excreta and remain in the dirt. These are liable to be taken up at any time by other members of the herd, or by hogs. At times, diseases are carried along the gutter from one cow to another; therefore, the manure should be removed as often as possible and any unhealthy discharge from a cow should de disinfected at once. It is well to completely disinfect the mangers and floors occasionally. It frequently happens that, where grain or wet feeds are given in warm weather, the manger becomes so foul that the cows refuse their feed, or eat it with little relish; therefore, the mangers should be so constructed that they can be easily cleaned. Cleanliness adds to the comfort and health of the cow, her attendant and the consumer of her product.

The comfort of the cow is economically important; because, the cow which is comfortable is more certain to remain healthy and produce a larger quantity of milk; therefore, the buildings should be such that the cattle may be protected from very cold weather, cold drafts, cold rains, intense heat, etc. A cow consuming a large amount of feed and producing a large flow of milk is giving off a large amount of heat and should not be kept too warm. If well fed, cattle will stand a good deal of cold; but sudden, radical changes are always detrimental. It is probable that the best stable temperature is between 40° and 60° Fahr. This temperature is not very difficult to maintain in winter, and in summer the cattle are usually out in the open where there is an abundance of fresh air. Protection from cold should not be at the expense of an abundance of fresh air, and good ventilation must be maintained. A close, poorly ventilated

stable becomes damp which is favorable to the development of bacteria and bad odors which taint the milk. The air, breathed over and over by the cattle, becomes polluted with poisonous waste gases from their bodies and depleted of oxygen which is so essential to life and energy. When one enters a close unventilated stable in the morning, the air is almost unbearable for a time: such conditions reduce the vitality of the animals, rendering them more susceptible to disease, favoring colds, and the spread of any infectious disease which may be in the herd, all of which tend to lower the production of the animal. Cows kept in such stables will not consume as much feed and will not use to the best advantage what they do consume.

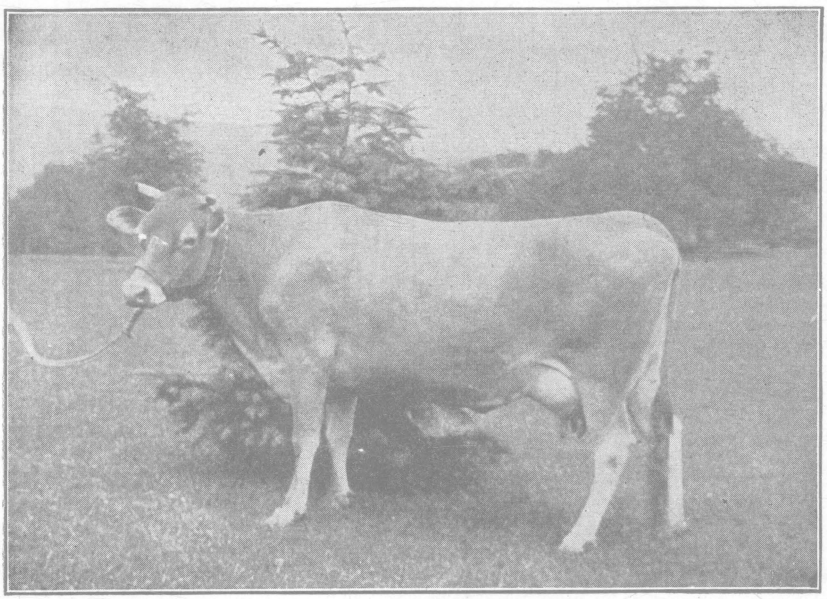

Fig. 1. Clean and in good producing condition.

Comfortable stalls and ties should be provided. The stalls should not be so narrow that the cows are crowded, and the cows should not be compelled to lie on a cold cement floor without an abundance of bedding. This is probably the cause of some udder troubles and is not, to say the least, most comfortable for the cow. Greater comfort could be obtained by the use of box stalls, but they require too much space which makes them expensive. Oat straw is better for bedding cattle than wheat straw because it absorbs the liquid more readily and stays to its place better. Any kind of straw, fine shavings, and saw-dust may be used; but materials which contain a large amount of dust should be avoided.

GENERAL CARE OF THE HERD

THE COW

In order to become a successful herdsman, one must learn the nature and needs of dairy cattle. This knowledge can be obtained by a diligent study of books, papers, and cattle. Perhaps the most important trait in a good herdsman is to be able to see quickly any change in the condition of the individuals of his herd. He should be constantly in touch and in sympathy with his cattle, ever on the lookout for anything which may go wrong, and ready to supply every need as far as possible.

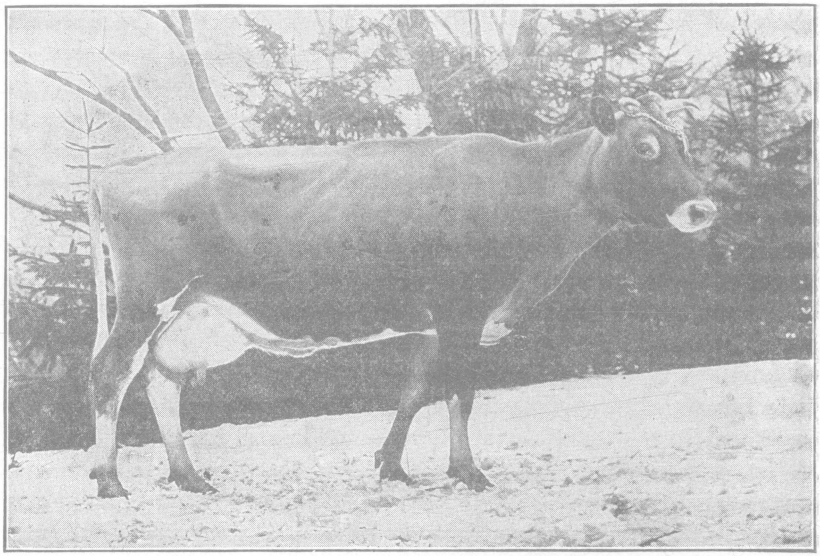

Fig. 2. A good cow but in too thin flesh to do her best work.

CARE ABOUT THE BARN

It is much more agreeable to work with cattle which are gentle and easily handled, than with nervous animals. This is brought about by treating them kindly and by permitting no rough treatment. Every cow which grows up in the herd should be taught while a heifer to lead. This can be done easily if she is handled with care. Kicking and other bad habits are usually the result of ill treatment. Blows and kicks may cause spoiled udders, abortion, rupture, loss of an eye, broken ribs, broken tail, etc. Such treatment makes them wild and even ugly, and undoubtedly decreases the flow of milk. The cow which is afraid of her milker will not give the maximum flow of milk.

Regularity in feeding, milking, etc., should be practiced. It is a good plan to adopt a regular order of work and carry this out on time as far as possible. This disturbs the cows least and aids greatly in getting the work done rapidly. Practically the same work is done each day and if it can be done in the same order and promptly on time, better results will be obtained. The following is a very good order for the main features of the work: In the morning, first pull all manure into the gutter, clean off the udders and flanks ready for milking. Milk as rapidly and thoroughly as possible, using both hands and taking all care to keep the milk clean. As soon as the milking is done, feed grain or silage and grain. When these are eaten, turn the cows out to water, clean out the stables and feed hay. Put the cows back into the barn, curry them well; then let them be quiet until work must begin in the afternoon, at which time follow about the same program, except the currying, and leave them with their hay for the night. Grain or silage may be fed just before milking but this is not desirable from a sanitary standpoint. Feeding the hay last gives time for all dust to settle before the next milking period. Care should be taken to prevent dust in the air while milking. During the remainder of the day, such work as preparing feed, and cleaning up the yards may be done. When the weather permits, it is a good plan to clean up the droppings from the yard daily to prevent their being mixed with the dirt which is a waste and a detriment to the yard. Care should be taken that ice does not form in doors and about watering troughs. Cement floors or ice on which cows slip may be sprinkled with sharp sand. "Floats" may answer this purpose inside the barn as sand may clog the sewers when the floors are washed frequently.

Milking. It is best to do the milking first in the morning for two reasons: (a) There is less dust in the air at that time; and (b) it keeps the milking periods more nearly an equal time apart. It is a mistake to have the milking period between morning and evening milking 8 hours and that between evening and morning 16 hours or the reverse. It is best to have not over 2 hours difference. Milking with two hands as rapidly as the cow will give down her milk gives most satisfactory results. To milk with wet teats is not good for the teats and is unsanitary. Milking twice daily is sufficient unless the cow is a very heavy milker or is under test for advanced registry, when she may be milked three or four times. The thin, manure-plastered condition in which so many milk cows come from the barns in the spring speaks of little profit, less healthy cows and ignorant or unthrifty, careless dairymen. One cow well cared for is more profitable than two or three half cared for.

Exercise. Cows should have exercise daily when the weather is not too severe. A sufficient amount will be provided if they are out for an hour or two daily (depending on the weather). It is a mistake to keep cows out in the field in winter for what little they may "pick" or to feed them stover, during wet or cold weather. It is detrimental both to the cows and to the fields. Some farmers provide sheds in which the cattle run loose for a part of the day and are fed their roughage. This is a good practice, if all are dehorned and plenty of bedding is provided to keep the cows clean; because, it reduces the amount of labor, makes the cows more comfortable and preserves the manure; but requires more bedding.

WATER

Not much was written about water in the circular on feeding and, since it is one of the things commonly neglected, it is again mentioned here. The average cow, under normal conditions, will drink about 9 to 10 gallons of water daily. Whether in the pasture or in the barn, cows should have access to an abundance of fresh water twice daily. Unless there are good flowing springs, the best water comes from wells and may be pumped by means of windmills or gas engines. It is unwholesome for them to drink from stagnant ponds or streams, but clean running streams are not objectionable. If the water is ice cold in winter, they will not drink sufficiently large quantities of it; and it is a mistake to compel them to travel long distances for it. The best way is to provide a tank in the barnyard or under a covered shed and provide some means of taking the chill from the water, though it need not be warm. There are numerous tank heaters on the market which may be used for this purpose. Where such conveniences are not available, the water should be pumped from the well as the cows drink it. There are numerous individual watering devices which may be attached to the stall, but they are usually objectionable because rarely kept in a sanitary condition.

AT PASTURE

There is no more healthful place for cattle than in good pasture. They should not be turned out in the spring until the pasture has gotten a good start, because the young grass contains little real nutrients, the cows lose their relish for dry feed before the pasture is sufficient to supply their needs, and the pasture is impaired by tramping while the soil is soft and by too close "cropping." During the dry season some dry feed, silage or soiling crops may be necessary. It does not pay to let the milk flow drop too low at any time because it is practically impossible to bring it back to the same point

again. It is not good practice to compel cows to depend on pasture so late in the fall that they go into winter in thin flesh. Cows on poor pasture with poor fences are liable to become "breachy," a habit very difficult to overcome.

It is poor practice to "send the dog after the cows," because cows become angry and excited and heavy udders may be injured, and on rough ground legs may be broken or permanent lameness caused. Cows with heavy udders should never be unduly hurried.

For protection from flies see page 124.

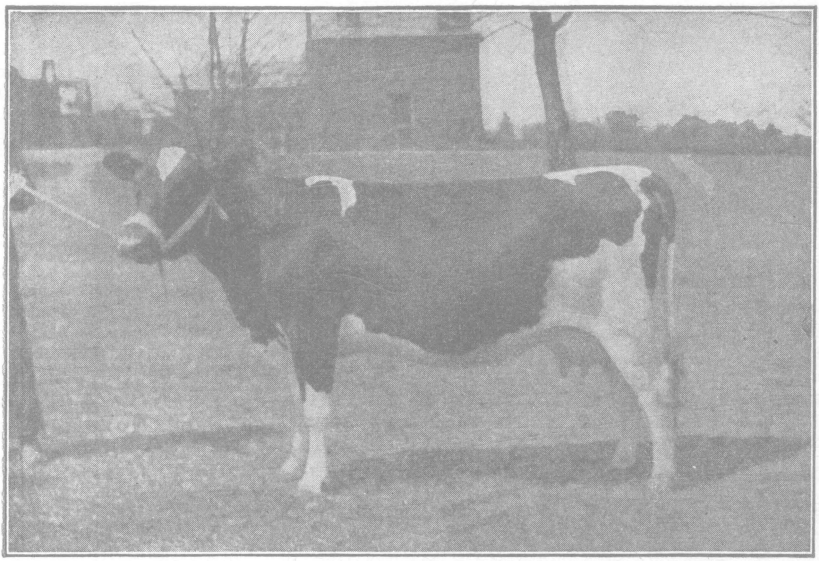

Fig. 3. In good condition 10 days before calving.

CARE AT CALVING TIME

The cow which is to remain in the herd her life time as a breeder and producer should be treated accordingly. When producing a large quantity of milk, she works just as truly as the horse which pulls the plow, and she should not be overworked. If fed properly as a heifer, she will be strong and well developed; and, if properly bred, she will calve at about 27 months of age. She needs this little more than two years of age to make a good growth before the heavy strain of motherhood comes upon her. She really begins to support the calf before she is two years of age. She should be bred to calve the second time about fourteen or fifteen months after the first time; and she should be kept milking the full 365 days and even longer, if

possible; this tends to establish the habit of persistency. After this she may be bred to calve once each 12 months. Cows six months in calf should not be permitted to run in pasture with colts or other animals which may injure them.

From four to six weeks should be given after the cow is turned dry to rest and flesh up before the second lactation period begins. Some cows dry off early while others dry off with much difficulty. The latter should not be dried off too rapidly or serious udder trouble may follow. Reduce the feed, do not remove all the milk and after a few days, milk but once daily and continue lengthening the time between milkings until the cow is dry. The time of the year during which it is best for cows to come fresh depends somewhat on the markets available, the kind of farm, and other factors. Generally speaking, the cow which calves in the fall, if properly fed, will produce the most milk during the year. Calves born in the fall are ready to go to pasture in the spring and make good gains. Where a uniform supply of milk is desired through the entire year, the breeding should be arranged accordingly. A breeding book should be kept in which is recorded the name or number of the cow, the name of the bull, the date of service, and the date due to calve. With this and the gestation table, based on the average period of 282 days, the date due to calve may be easily determined.

Since the calf is growing rapidly for the last three months before dropped and at the same time the cow is building up for the next year's work, her feed should not be cut down much when turned dry, unless she is fat at that time. She should not be *very* fat when calving time comes but should be in good flesh and in a healthy, "sappy" condition (Fig. 3). The ration fed at this time need not greatly differ in composition from that fed while producing milk. There should always be some laxative, or good conditioning feed in the ration. The best of these are fresh grass, silage, roots, bran, and linseed meal. The ration should not contain too much corn nor too bulky roughage. If a careful record of the date of service has been kept, it is easy to determine when a cow should be dried up, and when to place her in a convenient place for calving. Remove the cow to such place a week before she is due, because birth frequently takes place a week before the normal time. The place provided should be large enough to prevent accident in turning about and should have a clean floor. A large box stall well bedded is the best place in winter and a small grass lot with shade is good in the summer.

GESTATION TABLE

Served	Due	Served	Due	Served	Due	Served	Due	Served	Due	Served	Due	Served	Due	Served	Due	Served	Due	Served	Due	Served	Due	Served	Due
Jan.	Oct.	Feb.	Nov.	Mar.	Dec.	Apr.	Jan.	May	Feb.	June	Mar.	July	Apr.	Aug.	May	Sept.	June	Oct.	July	Nov.	Aug.	Dec.	Sept.
1	10	1	10	1	8	1	8	1	7	1	10	1	9	1	10	1	10	1	10	1	10	1	9
2	11	2	11	2	9	2	9	2	8	2	11	2	10	2	11	2	11	2	11	2	11	2	10
3	12	3	12	3	10	3	10	3	9	3	12	3	11	3	12	3	12	3	12	3	12	3	11
4	13	4	13	4	11	4	11	4	10	4	13	4	12	4	13	4	13	4	13	4	13	4	12
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6	15	6	15	6	13	6	13	6	12	6	15	6	14	6	15	6	15	6	15	6	15	6	14
7	16	7	16	7	14	7	14	7	13	7	16	7	15	7	16	7	16	7	16	7	16	7	15
8	17	8	17	8	15	8	15	8	14	8	17	8	16	8	17	8	17	8	17	8	17	8	16
9	18	9	18	9	16	9	16	9	15	9	18	9	17	9	18	9	18	9	18	9	18	9	17
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22	31		Dec.	22	29	22	29	22	28	22	31	22	30	22	31	22	July	22	31	22	31	22	30
	Nov.	22	1	23	30	23	30		Mar.		Apr.		May		June	22	1		Aug		Sept.		Oct.
23	1	23	2	24	31	24	31	23	1	23	1	23	1	23	1	23	2	23	1	23	1	23	1
24	2	24	3		Jan.		Feb.	24	2	24	2	24	2	24	2	24	3	24	2	24	2	24	2
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30	8			30	6	30	6	30	8	30	8	30	8	30	8	30	9	30	8	30	8	30	8
31	9			31	7			31	9			31	9	31	9			31	9			31	9

After placed in the box stall, she should be seen at least three or four times each day because of the assistance which may be needed. If the calf does not come properly and the cow is permitted to strain for many hours, she becomes weak, the parts become swollen and serious results may follow. A little assistance just at the right time may save both cow and calf. It is not possible to describe here all the difficulties which may arise. The front feet of the calf should appear first, followed by the nose lying on top of the legs. When in this position, there is usually no difficulty unless the calf is large. If the cow strains for one hour or more and nothing appears, if only one foot appears, or if the head does not appear, the cow should be examined. If one leg or the head is turned back, the calf should be pushed back and the head or leg straightened. If this cannot be done, a veterinarian should be called at once. It is possible for the calf to start in almost any position and there is nearly always difficulty unless the natural position is taken. If there is still difficulty after the calf has started right, the cow may be assisted by pulling strongly but gently on the legs as the cow strains. Care must be taken to not tear the parts. After the calf is born, the cow should clean in a short time. If the afterbirth remains one day, it is apt to remain until removed. This should be done by the end of the second day or on the third day. Some breeders recommend leaving the afterbirth until it is absorbed or comes away as a discharge. Disinfectants are injected daily in such cases. When the hand is inserted to remove the calf or afterbirth, great care must be taken not to injure the surrounding tissues. The extended part of afterbirth may be twisted about a stick and pulled gently while the hand is inserted and worked about the remaining portion, carefully loosening it from the wall of the uterus. Before attempting any of these operations, it is necessary to disinfect the hand and arm. This is best done by washing thoroughly with soap in warm water; then washing in a disinfecting solution and oiling well with carbolized vaseline or linseed oil which has been boiled and kept in a closed vessel. Lard heated hot enough to kill all germs may be used. After the operation, the hands and arm should be thoroughly washed and disinfected again; since there is always some danger to the person of blood poisoning, where the afterbirth has remained for some time. If germs are carried into the cow on a dirty hand, they may cause her death. (See disinfectants page 125.) If there is a foul discharge from the cow after she has been fresh for several days, she should be washed out until the discharge disappears. See page 125. Boiled water should be used in mixing the disinfectants for this purpose. It must not be forgotten that, in all of the above operations,

the strictest cleanliness must be exercised. After the calf is born, look well to the feeding of the cow. Continue the laxative feeds and do not bring her up to heavy feeding before a week has elapsed. If at that time all is well, she may be given gradually a more abundant ration. Before the calf is born, the udder should be rubbed with vaseline or lard to keep it soft and, in rare cases, it may be necessary to milk out a portion of the milk. If milking is started, it must be kept up. If the udder is "caked" after calving, it should be bathed in hot water containing a little sugar of lead. See treatment for garget on page 120. If she is a heavy milker, be on the watch for symptoms of milk fever during the first few days.

HEIFERS

The feeding and care of calves will be treated in a separate circular and therefore will not be discussed here.

Heifers intended for cows should be kept growing rapidly until they become cows. It is not desirable to keep them too fat nor too thin at any time, though experiments have shown that dairy heifers kept fat milked practically as well as those kept in good growing condition. It is often said that heifers can "rough it" from the time they are six months old until nearly ready to calve; consequently, they are turned to the straw stack, given a little ear corn and stover and possibly a little hay. This is bad practice. While growing they need more protein than these feeds provide. Many of them become stunted by such treatment and never entirely overcome it. They do not require as much care during the winter seasons as the cows; but, must not be neglected, if their best development is to be obtained.

In the spring, they should not be taken to the back pasture and left without being seen for a week at a time; but they should be seen and salted at least twice each week and to see them daily is better, because so many things may happen. They may get sick or injured or get out and do damage to crops and their breeding is liable to be neglected. If the bull is kept with them, the date of breeding is usually not known and recorded. What has been said about cows at pasture applies to heifers also.

While in the barn, it is a good plan to let heifers of the same age run loose in pens except when feeding, at which time they may be kept in stanchions. The proper time to breed heifers is when they are 17 to 18 months of age. Large, growthy heifers may be bred a month earlier while small, undeveloped heifers should not be bred until later. Heavy bulls should not be used on heifers without the use of a breeding crate. Special attention should be given them at calving time. If handled gently and often, they will be much more easily "broken" when fresh.

CARE OF THE BULL

The bull should not be permitted to run with the cows for the following reasons:

1. A cow is sure to be served the first time in heat after calving, which gives her less than ten months for a milking period, if milked up to calving.

2. Heifers will be served too young, which will dwarf their growth and may cause many to have difficulty in calving.

3. The date of service is often not known; consequently, the date due to calve can only be guessed at. A herd book should be kept, showing names, numbers, and dates of all breeding.

4. The cow will be served many times during the day which is not best for the cow or the bull. One service is as good as a dozen.

5. Bulls of any age are not to be trusted in the open and may, without a moment's warning, attack and kill or seriously injure someone. No one should take chances with a bull, no matter how gentle he may appear to be. It is usually the quiet bull which does the damage simply because he is trusted once too often. He may also attack and injure horses or other animals.

6. He is apt to go through fences and do damage elsewhere than on the farm of the owner.

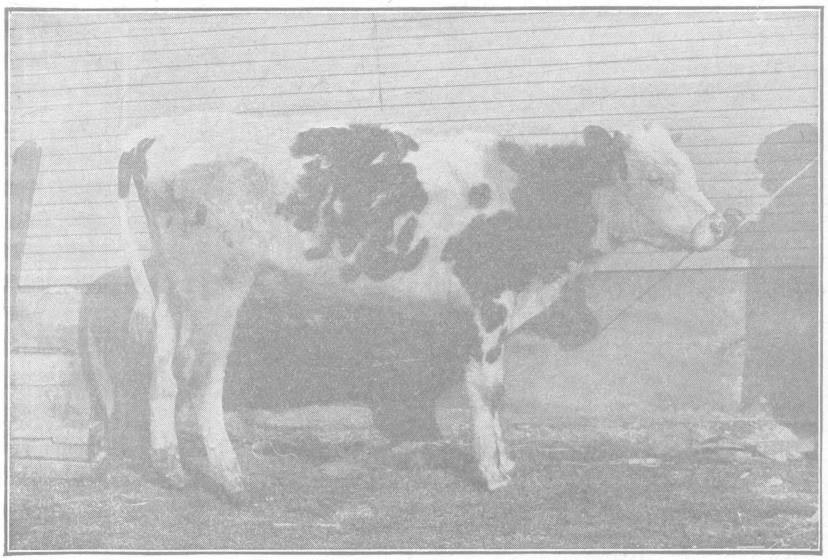

Fig. 4. A starved yearling in no condition for breeding.

A ring should be placed in every bull's nose by the time he is a year old and renewed as often as necessary to keep it strong. It is always best to lead him with a strong staff and at the same time have

a rope, chain or strap attached to the ring so that, if one or the other comes loose, he will not be free. The safest way is to keep him in a small lot well fenced with a sheltered stall attached. Where possible, this stall had better be in sight of the cows or other cattle where he is less likely to become restless and ugly. Where two of the same age or size are kept, it is a good plan to dehorn and turn them together in a securely fenced lot where they have plenty of room. They soon get over their differences and are company for each other. It is wise to dehorn all bulls except show bulls. A small breeding pen may be built in one corner of the lot where the cow can be taken from the outside and the bull let in without handling. If the bull is vicious a breeding crate may be used with a protected passageway leading to it from a stall. The bull may be fastened in the stall, the cow placed in the crate and the bull led to the crate by the attendant walking in the protected passageway. If the bull is to be handled at all, he should be handled gently, but firmly and daily. This is necessary with show bulls.

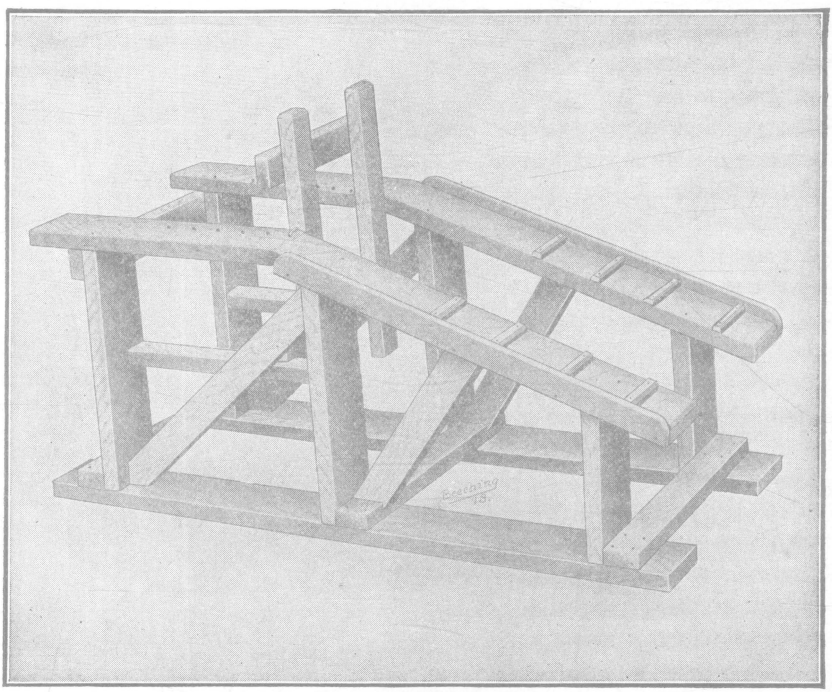

Fig. 5. Breeding crate. This crate is made entirely of 2x4 and 2x12 pieces. The bottom pieces are 9 feet long; the width between planks is 2 feet; the height at the front is 20 to 24 inches; the length from rear to center post is 4½ feet; and the height of the center post should be from 3 to 3½ feet.

Except in severe weather the bull is better in the open where he can exercise and keep his hoofs down. If kept in a closed stall and fed well, he usually gets fat and lazy, his hoofs grow long and his feet frequently become inflamed, unless the stall is kept very dry When a lot is not available, he may be exercised in a tread power or tied to a wire cable stretched between two strong posts. If trained early bulls may be used as oxen and made to do good service; and if worked regularly, they are much less inclined to become ugly.

When a heavy bull is used on a small cow or heifer, it is safest to use a breeding crate. This is more satisfactory even with a mature cow. A good breeding crate can be made in the manner shown by Fig. 5. It is not best to use a young bull for service before one year of age and then on only a few cows until two years of age. It is not a good practice to feed the bull on the foods refused by the remainder of the herd. He should be given good, wholesome food. The same mixture fed the cows may be used, but he should not be permitted to get too fat.

How long should a bull be kept? The answer to this question depends on his transmitting power and activity. If he is worth purchasing, he is worth keeping until his heifers are in milk. If he proves exceptionally good, he should be kept in service by some one as long as he lives. If his heifers prove to be poor producers, he cannot go to the butcher too soon. It is a mistake to use a young bull and dispose of him before his value is known. Many of the bulls, which would have done most for their owners, have been slaughtered before their value was known. The fact that he is at least one-half the herd from a breeding standpoint should be kept in mind in his treatment.

HEALTH OF THE HERD

From an economic point of view, the health of the herd is of vital importance. The heavy milking cow is more subject to disease and injury than any other of the cattle kind. Though the owner does his best to protect the herd, there will be losses by disease and injury and when the herd is not properly cared for, these losses become much greater. Neglect may cause the ruin of an entire herd by disease. The prime factors in keeping a herd healthy are shelter, light, fresh air, pure water, good food and protection from injury and diseased animals. There is a heavy drain on the system of a cow producing a large quantity of milk; and, for this reason, it does not pay to withhold a generous supply of wholesome food. This and proper surroundings have been discussed.

The most successful herdsmen are those who have trained their eyes to catch quickly any irregularity in a cow's appearance or actions which might indicate disease or injury. Each cow should be looked over daily by the herdsman and any ailment should be treated immediately. Prompt action frequently saves a cow. For the treatment of diseased cows, a closed stall, or better a separated building, is desirable. This should be so constructed that it can be easily washed and disinfected. There are few herds which do not at some time become infected with some disease which is more or less contagious and should be treated away from the rest of the herd. Only the diseases most commonly troublesome will be discussed briefly here. Every herdsman should be provided with some good book on cattle diseases, for reference and to familiarize himself with symptoms and treatment. Cases not understood should not be treated unintelligently but frequently immediate attention is necessary and there is no time to go for a veterinarian.

APPARATUS NEEDED

Instruments. Every dairyman who keeps even a small herd will find it convenient to have the following medical equipment. A clinical thermometer should always be at hand and the herdsman should know how to use it. It can be gotten through any drug store or from any firm dealing in veterinary instruments. The normal temperatures of mature cows are from 99° to 102° and may reach 103° Fahr. The temperature of young animals frequently runs a little higher than that of mature animals. The pulse ranges from 40 to 50 and respiration (breathing) from 10 to 20 per minute. Two or three milk tubes of different lengths, a trochar and canula, a long neck pint or quart bottle for drenching, a milk fever outfit or bicycle pump, a large syringe or funnel and three feet of small, rubber hose, and one graduate or measuring glass should be provided. Remember that the milk tubes should always be sterilized by heat or a disinfectant before using.

Medicines. The following medicines should be kept on hand: 1 pound bottle crystallized carbolic acid, 5 pounds epsom or glauber salts, 1 pint caster oil, 1 gallon linseed oil, creolin, vaseline, carbolized vaseline, acetate of lead (sugar of lead), flowers of sulphur, hydrogen peroxide, 1 pint of tincture of ginger, and 1 pint of tincture of gentian. Dissolve the carbolic acid by placing the bottle in warm water and add a very small amount of water to keep it in solution. Make the carbolized vaseline by adding to a pound of vaseline a little less than one-half ounce of the dissolved carbolic acid, then warm and stir thoroughly while cooling Other medicines may be needed but these should be always available.

DISEASES

Indigestion. This is one of the most common ailments and is usually caused by over-eating, spoiled feeds, too much dry roughage with little grain, etc. It varies in severity from very light cases to impaction of the stomach or bowels. The first symptoms in acute cases are the refusal of a part or all of the food given and a failure to chew the cud. The cow becomes dull and later lies down, refusing to arise except when forced to do so. If she refuses all her food at once, the case is severe and should be treated accordingly; however, there are other things which cause a cow to refuse food. The cause should be determined if possible. When the case is severe there is little or no movement of the bowels and the temperature rises much above the normal. The working of the bowels can be determined by placing the ear to the side near the flank. If they are working properly, there will be a gurgling sound. In other cases the hair becomes rough and the skin hard, the eyes dull and the appetite not good.

Treatment. At the first symptom, the feed should be withheld one or more feeding periods, depending on the case. Administer a dose of 1 to 1½ pound of salts dissolved in warm water, or two or three pints of raw linseed oil. If there is no passage within six to eight hours, give another dose. After a good passage is secured, give as a stimulant, a tablespoonful two or three times daily of equal parts of tincture of ginger and gentian. If the cow is very sick from the start, a veterinarian had better be called. When the feed is returned, give appetizing feeds, as bran mash, or feeds containing oil meal and bring the cow back to full feed gradually.

Scours. This trouble is usually caused by fresh grass, spoiled feeds, too sour silage, too much salt, etc. It is generally sufficient to remove the cause or feed dry feeds with the grass. If due to sour silage, feed less of it and more dry roughage.

Hoven or bloat. Bloating frequently causes much loss where cattle are pastured on clover, alfalfa and other legumes. It may be due to other causes also. It is easily recognized by the distending of the body, due to the formation of gas in the stomach. It acts quickly and the animal may die in a very short time if not relieved.

Treatment. In mild cases place a large stick or rope through the mouth and tie back of the horns. Walk the animal about slowly. If carefully done, a piece of small hose may be passed down into the stomach permitting the gas to escape. If the case is a severe one, the best way is to puncture the animal and let the gas escape. This may be done with a trochar and canula, or with a knife. Often quick action is necessary and only a pocket knife is available, in which case it should be used without hesitation. The puncture

should be made on the left side near the short ribs about the circle shown in Figure 6. The wound made should be washed daily with a disinfectant and treated with vaseline. Bloating can usually be prevented by allowing the cattle to partly fill up on other grass or dry feed before turning them into the clover, until they become accustomed to it. It is best to keep them on it only a short time for the first few days and that after the dew is off. Though great care is taken, it is liable to occur at times.

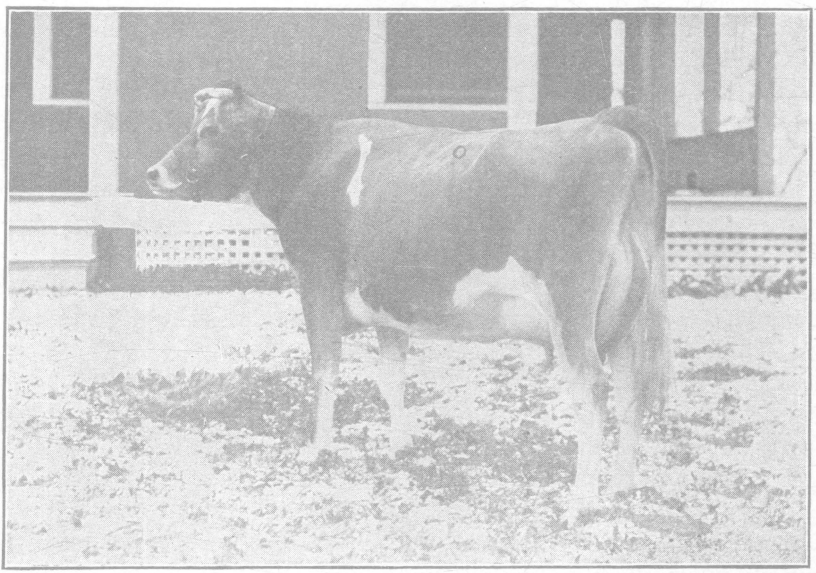

Fig. 6. Showing where to puncture for bloat.

Pink eye. This is a contagious disease and may be spread through the entire herd. The eyes become badly inflamed and are usually kept closed. The tears flow freely. When a case appears further spread of the disease may possibly be stopped by a change of pasture. The animal affected should be placed in a dark stable, kept well fed and the eyes treated with a solution of 1 dram of carbolic acid dissolved in 4 ounces of boiling water. If more cases appear and it becomes severe, call a veterinarian.

Poison. Poison may be caused by certain green plants, by spoiled feeds, or by a chemical, such as arsenic, strychnine, lead, zinc, etc. Paint and spraying mixtures should never be left where cattle can get them and cattle should not be compelled by short pasture to eat weeds. The symptoms of poison vary. Some animals are paralyzed while others have convulsions, or fits. In case of such symptoms, poison should be looked for and, if found, removed before others get it.

Treatment. The first step in treatment should be a good physic with oil or salts. If the poison is known to be lead, use epsom salts in large doses. Follow this with a stimulant. Call a veterinarian.

Foul-Foot. This is an inflamation of the foot due to an infection between the toes. The infection is usually gotten from muddy yards. When there is lameness, the foot should be examined first. In foul-foot there will be a soreness between the toes and usually a foul smell. If this is not found, look for a nail or other injury.

Treatment. Wash out clean, treat with a strong disinfectant and keep the animal in a clean, dry place. If severe, treat with pure creolin applied with a swab. A little cotton soaked in pine tar and kept between the toes is good. Lime or copper sulphate may be dusted between the toes after thoroughly washed.

Abortion. Premature birth may be due to one of the following causes: Injury by hooking, kicking, a fall, bad food, or by infection. Accidents can best be prevented by keeping the cows away from the above causes. Where such cases occur it is important to see that the cow cleans and gets along well. Where there is a foul discharge, the cow should be treated frequently with a disinfectant until the discharge disappears. If the cause is not known, the case should be treated as if it were contagious and the cow removed from the herd. Contagious or infectious abortion is by far the greatest cause of loss and probably causes greater loss to cattle owners than any other disease. It is due to a germ which is transmitted from one animal to another in various ways. When it gets started in a herd, it is very difficult to control and usually spreads through the entire herd, lingering from year to year. After a cow has lost from one to three calves, she usually becomes immune to the disease and carries her calves full time thereafter. For this reason it may seem to die out in a herd but usually reappears when new cows are brought into the herd.

Treatment. Where abortion occurs from any cause, it is best to burn or bury deeply the calf and afterbirth and to thoroughly disinfect the place where the calf was dropped. The cow should be disinfected, and kept away from the rest of the herd and should not be bred within three months. However, if she has the contagious form, she will probably have infected other members of the herd before the abortion took place. She should be disinfected every few days until the discharge ceases. If other cases appear, consult a reliable veterinarian. Only the most thorough methods of disinfection of the premises seem to avail much. No certain cure has been found; therefore, do not be "gulled" by persons who advertise "sure

cures." An attempt is now being made to diagnose and control the disease by the injection of serums; but this is, at present, only in the experimental stage. If it should render cattle immune, it may still leave the germ in the body and the cow dangerous to other cattle.

It is possible that many cases may be prevented by feeding a proper disinfectant. Carbolic acid is generally used for this purpose. It is also injected beneath the skin, but this should be done by a veterinarian. Feed daily for one week one teaspoonful mixed in a pint of warm water and sprinkled over the feed. Repeat this treatment one week later, doubling the dose. In two or more weeks repeat and gradually increase the dose to three teaspoonfuls properly diluted. Give this treatment once each three months until after calving.

If one's herd is free from this disease, he should spare no effort to prevent its introduction by bringing in infected animals, by breeding outside cows to the herd bull or by breeding cows to outside bulls. Every herd where the bull serves cows for neighbors is in danger. Where outside breeding is done, careful disinfection should follow. It may be carried on the clothing of a person working with an infected herd. Besides the loss of calves, the vitality of the cow is often reduced and it frequently causes sterility. It becomes deep seated in the system of the animal and is difficult to treat successfully.

Tuberculosis. This disease is a twin to abortion in its menace to our dairy herds and like abortion cannot be adequately discussed here. Today it is more widely discussed than any other disease known among cattle or men. Tuberculosis is caused by a germ, and is one of the most grave problems with which dairymen have to deal. More and more the large cities, through their health departments, are crying out against the disease; and it probably will be only a short time until products from herds which are not free from the disease cannot be sold in the markets unless pasteurized. The writer believes that this disease and contagious abortion are the most serious obstacles in the path of future successful dairymen.

It is now reasonably well established that small children do contract the bovine or cattle type of the disease. Besides the relation of the disease to man, it causes annually a great economic loss to dairymen. These losses come in the occasional loss of a cow, the reduced flow of milk, the failure of cows to breed, the infection of hogs, etc. It is the opinion of the men who best understand the subject, that every dairyman should do his utmost to keep his herd free from the disease. This is not an easy task but can be accomplished by the proper use of the tuberculin test. The disease can be

eradicated from the state only when the individual dairymen, aided by the state, take up the matter in earnest and stay by it for a number of years. The disease cannot exist, if the germ is not introduced from diseased animals. This occurs in various ways, but chiefly in the following: A diseased animal is purchased and mingles with the herd; cattle are put into quarters where diseased animals have been; and calves are fed skimmilk from a creamery which received milk from tuberculous cows. The disease develops very slowly and may show little signs in the cattle until the herd is badly infected. Dairymen who have clean herds can keep them clean by keeping the above channels of infection closed. Most states have laws preventing the shipping of diseased cattle into the state. Ohio has just passed such a law. The disease is already established in the state and if eradicated at once would take a large percentage of our cows.

Sterility. Cows fail to breed from various causes. The opening to the uterus may be closed or nearly so. It may be caused by abnormal secretions in, or a diseased condition of the uterus, or by diseased ovaries, The latter condition is frequently caused by contagious abortion.

Treatment. Frequently a change of bull will overcome the trouble. If due to diseased ovaries, it probably cannot be cured. If caused by a closed uterus, it may be opened by a veterinarian. The various breeding powders advertised may aid in some cases but are not "sure cures."

Garget or caked udder. This is an inflamed (swollen) condition of one or more quarters of the udder and is usually attended with, or followed by, clotted or stringy milk. It frequently occurs at calving time when the milk gland becomes very active. The majority of cows have more or less of it at this time. Other causes are bruises, cold cement floors, and infection with bacteria. Often the bacteria are carried in with milk tubes which have not been properly disinfected. They may grow into the opening in the teat. Frequently cases occur for which no cause can be determined. Many light cases pass off in a day or two and need no treatment, but it is always safe to begin treatment at once.

Treatment. The most simple and perhaps the best treatment is to bathe the udder from fifteen to twenty minutes with hot water (as hot as can be endured by the hand) two or three times daily and wipe it thoroughly dry each time. A little acetate of lead may be added to the water. Dissolve 1 part gum camphor in 10 parts of lard and rub in well. Keep the udder well milked out. When garget is due to infection of the udder, it is more serious, and in a large percentage of cases the quarter affected will be lost. Inject into the

udder a solution of one part carbolic acid to 50 parts of boiled water. Milk this out in a few minutes and treat as previously directed. Nothing should be injected into the udder unless the case is a serious one; more harm than good may be done.

Occasionally small boils appear in the udder or about the base of the teats. One quarter or the entire udder may become inflamed and the inflammation be followed by the boils. This is due to infection and may pass from one animal to another on the hands of the milkers. Wash the outside of the udder with a good disinfectant and treat with carbolized vaseline or some other good salve. Such cows should always be milked last or the hands carefully washed and disinfected before milking others. It is a good plan to give the cow a disinfectant internally, one-half ounce of hyposulphite of soda dissolved in water. If the infection appears to be on the inside of the udder, inject a solution of carbolic acid or hydrogen peroxide.

Cowpox. This is an infectious disease which usually spreads through the entire herd unless carefully handled. It appears on the udder or teats as pustules or blisters containing a yellowish fluid; later these blisters break and a scab is formed. It is not usually serious but causes the animal a great deal of pain and the milker much inconvenience. It is carried from one cow to another on the hands of the milker; therefore, such cows should be milked last, and the hands washed and disinfected. In case the milker's hand is cut or scratched, the disease may be transmitted to him; when this occurs, it renders him immune to smallpox the same as vaccination. The affected parts of the udder should be washed with some disinfecting solution and treated with carbolized vaseline or zinc ointment.

Cut or scratched teats. These occur often and should be thoroughly cleansed and treated with carbolic acid solution, creolin solution, or hydrogen peroxide; then treated with vaseline or some good salve. If the injury is severe the cow should be kept in a clean place or the teats should be protected from dirt by a bandage.

Open or leaky teats. These are very difficult to cure. A good veterinarian may be able to close an opening during a dry period.

Milk fever. This disease usually occurs within a week after calving, but may, in rare cases, occur at or immediately before calving. When discovered, the cow is usually down and unable to rise. At first the rear quarters appear to be paralyzed, and later the paralysis extends forward and the cow becomes unconscious. She usually lies with her head to one side.

Treatment. Remove all milk from the udder, disinfect the teats and pump the udder full of air with a bicycle pump or milk fever outfit. The air should be kept in the udder from ten to fifteen

minutes by tying a rag string around the teats. It should then be worked out and the process repeated as often as necessary. A cotton filter should be placed in the rubber tube to filter out dust. Rub the rear parts of the body and legs vigorously with a hand full of straw. Do not permit the cow to lie too long on one side. If the treatment is administered early, the cow will get up and be eating within one or two hours.

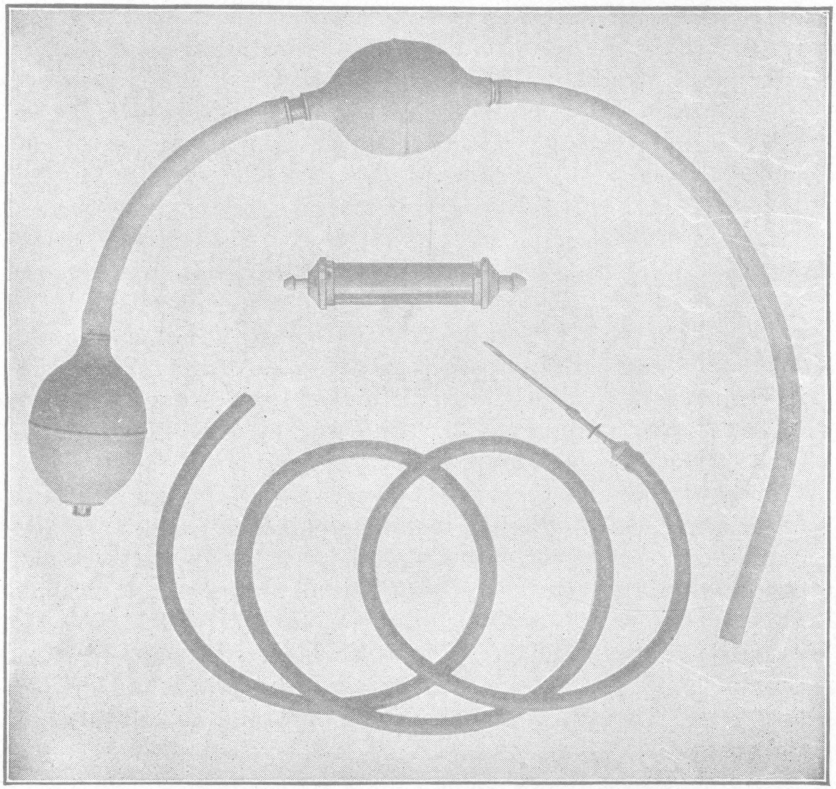

Fig. 7. Milk fever outfit. The two loose ends of hose are attached to the cylinder shown in the center. This cylinder contains cotton through which the air is filtered.

Closed teats. When this is due to an obstruction at the base of the teat (where it joins the udder) it is a very difficult matter to open it successfully and should be attempted by someone who has had experience. If a scab forms at the opening of the teat, remove and wash thoroughly after milking with a disinfectant and treat with vaseline.

Bloody milk. Frequently a cow will give bloody milk from the effect of a bruise, garget, or other disease. It may be due to a natural weakness of the udder tissues. If blood appears in the separator or at the bottom of the cans, each cow should be watched carefully while milking until the source is discovered.

Treatment. If it is due to a natural weakness, it usually comes with the last milk, and there is probably no remedy. If due to a bruise, try to reduce the inflamation, and keep the cow quiet until it heals. If due to garget, treat accordingly. In case of either bloody or clotted milk, do not use it until the cause has disappeared.

Slimy Milk. This usually appears some time after the milk has been drawn from the cow. It is frequently thought to be caused by some condition of the cow; but it is usually due to certain bacteria which get into the milk after drawn. These bacteria frequently occur in stagnant water in ponds, watering troughs or cooling tanks. Cows will stand in ponds or mud holes in the summer in order to protect their legs from flies. The bacteria get on the udder and body and fall from the udder or body into the milk with the dust rubbed from the udder or body by the milker. They may be on the vessels in which the milk is handled or fall into the milk later. Usually keeping the cow out of such places and the udder clean, and thoroughly scalding all vessels which come in contact with the milk, will remove the trouble. Water in cooling tanks should not be permitted to become stale. Colors and abnormal tastes may appear in milk and are often caused by bacteria. The cow should not be condemned unless there are evidences of udder diseases or until sanitary methods fail to remove the cause.

Hard Milkers. If cows are hard milkers, it may be partly overcome by forcing a small teat plug into the opening of the teat and leaving it there for a time. The plug should be silver and may be obtained from veterinary supply houses. It must be disinfected the same as the milk tube before using and should never be used unless the cow is extremely hard to milk.

Lice. Lice are frequently troublesome and may do much damage among small calves. Animals which lick themselves much and have a rough coat of hair should be examined for lice.

Treatment. Spray the cattle thoroughly with some of the fly remedies; or one part creolin to fifty parts of water. Apply two or three times, seven or eight days apart. Young calves may be rubbed with one-fourth pint of kerosene thoroughly mixed with one quart of lard. Strong disinfectants used on very small calves are apt to remove the hair. Clean out all bedding and spray the stables.

Flies. These pests are difficult to get rid of. The various spraying mixtures keep them off for a time but are not very satisfactory. The following mixtures have been recommended:

1. One-half gallon crude carbolic acid, one-half gallon oil of tar, and one-half gallon of cotton-seed oil. Thoroughly mix and spray.
2. Two parts creolin, one gallon cotton-seed oil and ten gallons of water. Mix and spray.
3. To one part of water, two parts soap shavings, four parts pulverized rosin and one part fish oil, boiled until rosin is dissolved, add six parts water, two parts oil of tar, two parts kerosene. Boil the whole fifteen minutes, and apply with a brush.

To kill the flies about the barn, spray the floor with the following: Five ounces white arsenic, one-half gallon molasses and ten gallons of water. This should be used with care as it is very poisonous. Apply it about the gutter while the cows are out. Another method is to put a teaspoonful of formalin or formaldehyde into one gallon of milk or sweetened water and place in pans about the barn. This should be kept away from cats or dogs. Prevent flies from breeding about the barns by keeping all manure as far away as possible.

Warbles. In some parts of Ohio warbles do considerable damage. They are caused by a fly and may be largely prevented by destroying the larvae before they leave the cows' backs in the spring. These grubs produce the flies which lay the eggs during the summer.

Treatment. Squeeze them out and kill them or rub thoroughly with kerosene and lard.

Dehorning. It is a good practice in most herds to dehorn all cattle, especially the bulls, and it is best done while the animals are less than a week old. It may be wise to keep the horns on purebred cattle where cattle are bred for sale or show purposes. There is always a loss from hooking where cattle run together and are not dehorned.

Treatment. With mature animals the horns must be removed with a saw or clippers. This should be done during the winter season when there are no flies. After the horns are removed it is well to treat the head with pine tar or creolin immediately. It is also well to tie a small bunch of absorbent cotton on as a protection, and to keep straw, etc., from falling into the head. This may be left on until it comes off, unless the horn does not heal properly, when the horn may be redressed. Dehorning young calves is best done by using caustic soda or caustic potash in the stick form. When the calf is two or three days old, clip the hair from over the

horn which can be felt through the skin, wet the end of a stick of caustic and rub over the top of the horn until there is a raw spot about the size of a cent. This is usually sufficient. It is a good plan to rub a little vaseline around the horn before applying the caustic to prevent the spread of the caustic. Care should be taken to wrap a paper about the end of the stick taken in the hand, or the fingers will be burned. Keep the caustic in a tightly corked bottle to prevent dissolving.

The diseases mentioned above are a few of the most common. There are many others which may be encountered, but they can not be discussed here. Every man practicing live stock farming should have some good book on diseases of farm animals, which has been published or revised since 1905; and it should be written in plain, simple language which the average farmer can understand. All animals which die should be buried deeply or burned. Dogs, hogs, or chickens should never be permitted to eat them unless thoroughly cooked.

DISINFECTANTS

By disinfecting is meant the killing of bacteria or germs which happen to be on the surface disinfected. Diseased cattle are frequently throwing out such germs from the body and they lodge on the floors, mangers, walls, etc., of the buildings and in the yards. An occasional disinfection may prevent other members of the herd from taking up these germs and contracting the disease. The animal itself may need disinfecting. One of the best disinfectants is sunlight and the dairymen should get as much of it as possible into their barns and yards. Instruments and vessels may be disinfected by boiling in water or in steam under pressure.

Stables may be sprayed with a solution of bichloride of mercury (Corrosive Sublimate) one part to 800 parts of water (one ounce to seven or eight gallons of water). It is very poisonous. After it has acted for a half hour or longer, wash out the mangers with fresh water before the cows eat from them. A five percent solution of carbolic acid may be used but it is expensive for such large surfaces. When used, it should be thoroughly dissolved in warm water. The odor is not desirable. Chloride of lime, six ounces to a gallon of water, may be used where the odor will not affect the milk. A good coat of white-wash on the walls and ceiling twice each year will help. See that the surface disinfected is well dried before the disinfectant is applied.

The Animal. In disinfecting an animal after calving, aborting, etc., great care should be taken that all instruments used be clean and disinfected and that the water used be previously boiled. One of the following may be used as an injection:

1. Carbolic acid, two or three ounces to one gallon of water. See that it is thoroughly mixed before using or the tissues may be burned.
2. Permanganate of Potash. Use just enough to tint the water.
3. Creolin. One part to 100 parts of water.
4. Hyposulphite of soda. One ounce to the quart of water.
5. Chloride of zinc. One-half dram to the quart of water.

To inject, sponge the external parts of the cow with the disinfecting solution; then insert the syringe or hose carefully, keeping the end pointed slightly upward. It need not be inserted deeper than eight or ten inches. The liquid used should be warmed to about 100° F. or blood temperature.

In the treatment of diseases, one must study each case. Considerable practical experience is necessary to the best results. It takes time for wounds to heal or an animal to recover from sickness. Patience and perseverance are necessary.

WHITEWASH

The following formula for whitewash has been recommended by the U. S. Department of Agriculture:

Take half a bushel of unslaked lime, slake it with boiling water, cover during the process to keep in steam. Strain the liquid through a fine sieve or strainer, and add to it a peck of salt previously dissolved in warm water, three pounds of ground rice boiled to a thin paste and stirred in while hot, half a pound of Spanish whiting and one pound of clean glue previously dissolved by soaking in cold water and then hanging over a slow fire in a small pot hung in a larger one filled with water. Add five gallons of hot water to the mixture; stir well; let it stand a few days covered from dirt. It should be applied hot, for which purpose it can be kept in a kettle or a portable furnace. Coloring matter may be added as desired. Where a less durable whitewash will answer, the above may be modified by leaving out the whiting and glue and omitting the boiling. It need not be applied hot and may be applied with a spray pump.

There are many things about the care of cattle which must be learned by experience. This is fully recognized by the writer; yet he hopes that the foregoing pages may offer helpful hints, especially to the beginner.